SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-43

Name: Loss Lake **County**: Minnehaha
Legal Description: T101- R52-Sec. 4
Location from nearest town: ½ west, 4½ south and ½ east of Humboldt, SD.

Dates of present survey: July 12-13, 2010
Date last surveyed: July 9-10, 2008

Managed Species	Other Species
Black Crappie	Orange-spotted Sunfish
Yellow Perch	Green Sunfish
Channel Catfish	
Walleye	
Common Carp	
Black Bullhead	

PHYSICAL DATA

Surface Area: 86 acres
Maximum depth: 8.5 feet
Volume: Unknown
Contour map available: No
OHWM elevation: None set
Outlet elevation: None set
Watershed: 1,920 acres
Mean depth: 6.9 feet
Shoreline length: Unknown
Date mapped: NA
Date set: NA
Date set: NA
Lake elevation observed during the survey: Full
Beneficial use classifications: (6) warmwater marginal fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Ownership of Lake and Adjacent Lakeshore Properties

Loss Lake is not listed as a meandered lake in the State of South Dakota Listing of Meandered Lakes, but the fishery is managed by the South Dakota Department of Game, Fish, and Parks (GFP). Most of the western shoreline is owned by GFP and consists of a Lake Access Area and a Game Production Area. The remainder of the shoreline is privately owned.

Fishing Access

The Loss Lake Access Area contains a concrete plank boat ramp, dock, fishing pier, shore fishing access and a gravel parking lot located on the southwest corner of the lake.

Field Observations of Water Quality and Aquatic Vegetation

The water in Loss Lake was fairly turbid with a Secchi depth measurement of only 0.3 m (12 in). Sago pondweed (*Potamageton pectinatus*) was abundant around much of the lake. Scattered patches of cattail (*Typha spp.*) and bulrush (*Scirpus spp.*) were present near shore.

BIOLOGICAL DATA

Methods:

Loss Lake was sampled on July 12-13, 2010 with three overnight gill net sets and five overnight trap net sets. The trap nets are constructed with 19-mm-bar-mesh (¾ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh (½, ¾, 1, 1¼, 1½, and 2 in) monofilament netting. Gill net and trap net sites are displayed in Figure 4.

Results and Discussion:

Gill Net Catch

Black bullheads (72.4%), yellow perch (18.1%), and walleye (7.4%), were the most abundant species sampled in the gill nets (Table 1). Common carp and channel catfish were also sampled.

Table 1. Total catch from three overnight gill net sets at Loss Lake, Minnehaha County, July 12-13, 2010.

Species	Number	Percent	CPUE[1]	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	360	72.4	120.0	±10.9	102.0	7	0	96
Yellow Perch	90	18.1	30.0	±16.1	54.9	16	0	109
Walleye	37	7.4	12.3	±0.4	0.8	43	8	90
Common Carp	9	1.8	3.0	±2.0	2.9	--	--	--
Channel Catfish	1	0.2	0.3	±0.4	3.2	--	--	--

* 5 years (2000, 2002, 2004, 2006, 2008)

[1] See Appendix A for definitions of CPUE, PSD, and mean Wr.

Table 2. Catch per unit effort by length category for various fish species captured with gill nets in Loss Lake, July 12-13, 2010.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Bullhead	--	120.0	112.0	8.0	--	120.0	±10.9
Yellow Perch	--	30.0	25.3	4.7	--	30.0	±16.1
Walleye	--	12.3	7.0	4.3	1.0	12.3	±0.4
Common Carp	0.3	2.7	1.3	1.3	--	3.0	±2.0
Channel Catfish	--	0.3	--	0.3	--	0.3	±0.4

Length categories can be found in Appendix A.

Trap Net Catch

Black bullheads dominated the trap net catch this year (98.5%). Common carp, walleye, yellow perch, black crappie, green sunfish, and bluegill were also sampled.

Table 3. Total catch from five overnight trap net sets at Loss Lake, Minnehaha County, July 12-13, 2010.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	3,656	98.5	731.2	±153.7	462.4	8	0	80
Common Carp	38	1.0	7.6	±2.2	0.2	52	3	94
Walleye	10	0.3	2.0	±2.0	0.2	40	10	84
Yellow Perch	3	0.1	0.6	±0.5	8.4	--	--	--
Black Crappie	2	0.1	0.4	±0.5	5.1	--	--	--
Green Sunfish	2	0.1	0.4	±0.5	1.0	--	--	--
Bluegill	1	0.0	0.2	±0.3	0.0	--	--	--

* 5 years (2000, 2002, 2004, 2006, 2008)

Table 4. Catch per unit effort by length category for various fish species captured with trap nets in Loss Lake July 12-13, 2010.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Bullhead	197.4	533.8	489.6	44.2	--	731.2	±153.7
Common Carp	1.0	6.6	3.2	3.2	0.2	7.6	±2.2
Walleye	--	2.0	1.2	0.6	0.2	2.0	±2.0
Yellow Perch	--	0.6	--	0.4	0.2	0.6	±0.5
Black Crappie	--	0.4	--	0.4	--	0.4	±0.5
Green Sunfish	--	0.4	--	0.4	--	0.4	±0.5
Bluegill	--	0.2	--	0.2	--	0.2	±0.3

Length categories can be found in Appendix A.

Yellow Perch

Management objective: Maintain a yellow perch population with a gill-net CPUE of at least 30 with a PSD range of 30-60 in three out of five lake surveys.

Yellow perch gill-net CPUE declined significantly in 2010 (Table 5). The mean length of sampled perch was170 mm (6.7 in) and their condition was excellent with a Wr of 109. The length frequency histograms from the samples in 2004 and 2006 indicate the perch in Loss Lake can reach 30 cm (12 in). However, growth for fish in in the very large year class observed in 2008 may be slower and they may not grow as large.

Table 5. Yellow perch gill-net CPUE, PSD, RSD-P, and mean Wr for Loss Lake, Minnehaha County, 2002-2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Mean*
CPUE	28.0		17.5		2.5		173.3		30.0	54.9
PSD	10		13		--		--		16	21
RSD-P	4		13		--		--		0	12
Mean Wr	110		104		--		102		109	100

* 5 years (2000, 2002, 2004, 2006, 2008)

Black Bullhead

Management objective: Maintain a black bullhead population with a trap-net CPUE of no more than 100.

Black bullhead CPUE tripled this year and is substantially higher than the objective (Table 7). Small fish with a mean length of 179 mm (7.0 in) continue to dominate the population (Figure 3). Channel catfish and walleye abundance is too low to successfully control the bullhead population at this time.

Table 6. Black bullhead trap-net CPUE, PSD, RSD-P, and mean Wr for Loss Lake, Minnehaha County, 2002-2010.

	2002	2004	2005	2006	2008	2009	2010	Mean*
CPUE	546.2	243.6		198.0	212.4		731.2	462.6
PSD	3	0		4	0		8	4
RSD-P	1	0		0	0		0	0
Mean Wr	99	90		82	87		80	92
Ave. TL	162	151		186	176		179	169

* 5 years (2000, 2002, 2004, 2006, 2008)

All Species

Black crappie and channel catfish CPUE is declining while carp, bullhead and walleye abundance is increasing (Table 7). Orange-spotted sunfish have not been sampled since 2004.

Table 7. Gill-net (GN) and trap-net (TN) CPUE for all fish species sampled in Loss Lake, Minnehaha County, 2002-2010.

Species	2002	2003	2004	2005	2006	2007	2008	2009	2010
COC (GN)	--		--		2.0		2.3		3.0
COC (TN)	--		--		--		0.6		7.6
BLB (GN)	88.3		79.0		114.0		147.3		120.0
BLB (TN)	546.2		243.6		198.0		212.4		731.2
CCF (GN)	--		--		10.5		5.7		0.3
CCF (TN)	--		--		1.0		0.2		--
GSF (GN)	--		--		--		--		--
GSF (TN)	--		0.2		0.4		--		0.4
OSF (GN)	--		2.0		--		--		--
OSF (TN)	--		0.2		--		--		--
BLC (GN)	--		--		--		0.3		--
BLC (TN)	3.2		3.8		1.0		2.0		0.4
YEP (GN)	28.0		17.5		2.5		173.3		30.0
YEP (TN)	2.0		6.8		18.6		4.4		0.6
WAE (GN)	--		--		--		4.0		12.3
WAE (TN)	--		--		--		1.0		2.0

COC (Common Carp), BLB (Black Bullhead), CCF (Channel Catfish), GSF (Green Sunfish), OSF (Orange-spotted Sunfish), BLC (Black Crappie), YEP (Yellow Perch), WAE (Walleye).

MANAGEMENT RECOMMENDATIONS

1. Stock channel catfish and walleyes, when available, to control bullheads and provide diversified angling opportunity.

2. Stock yellow perch as needed to accomplish the management objective.

3. Conduct control projects as needed to reduce black bullhead and carp abundance.

4. Plan and execute a major aquatic habitat improvement project that will aid the reproduction and recruitment of important game species.

5. Conduct lake surveys every other year to monitor the fishery.

Table 8. Stocking record for Loss Lake, Minnehaha County, 1990-2010.

Year	Number	Species	Size
1990	250	Northern Pike	Adult
1991	600	Yellow Perch	Adult
1993	2,038,500	Yellow Perch	Eyed Eggs
1995	837	Black Crappie	Adult
1999	825	Yellow Perch	Adult
2000	825	Yellow Perch	Adult
2001	987	Black Crappie	Adult
	840	Yellow Perch	Adult
2002	901	Yellow Perch	Adult
2003	1,548	Yellow Perch	Adult
	752	Yellow Perch	Juvenile
2005	804	Channel Catfish	Adult
	1,236	Yellow Perch	Adult
2006	260	Channel Catfish	Adult
	252	Yellow Perch	Adult
	2,055	Yellow Perch	Juvenile
	1,158	Walleye	Juvenile
	625	Walleye	Lrg. Fingerling
2010	8,600	Walleye	Fingerling

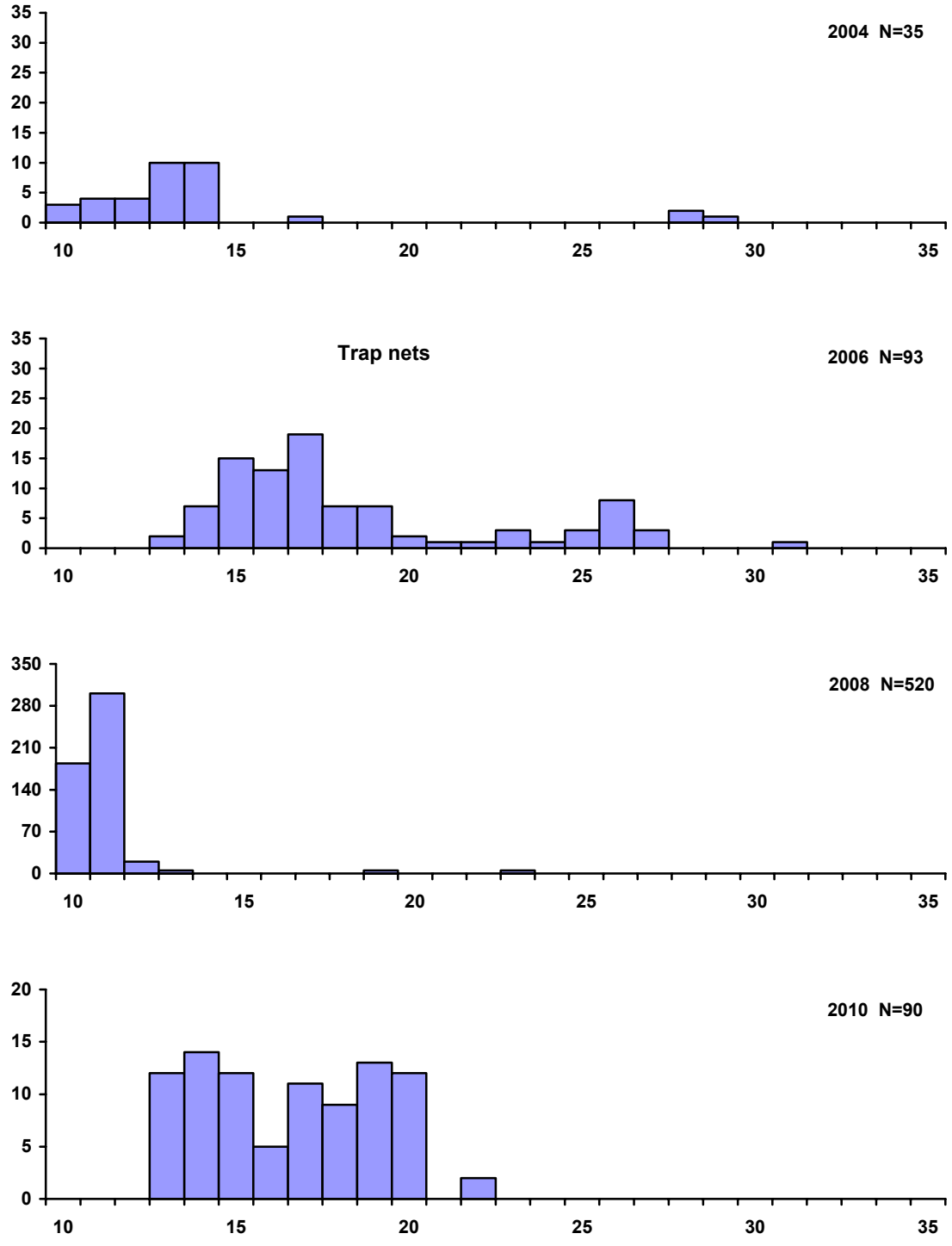

Figure 1. Length frequency histograms for yellow perch sampled with gill nets in Loss Lake, Minnehaha County, 2004,2008 and 2010. Trap net sample was used in 2006.

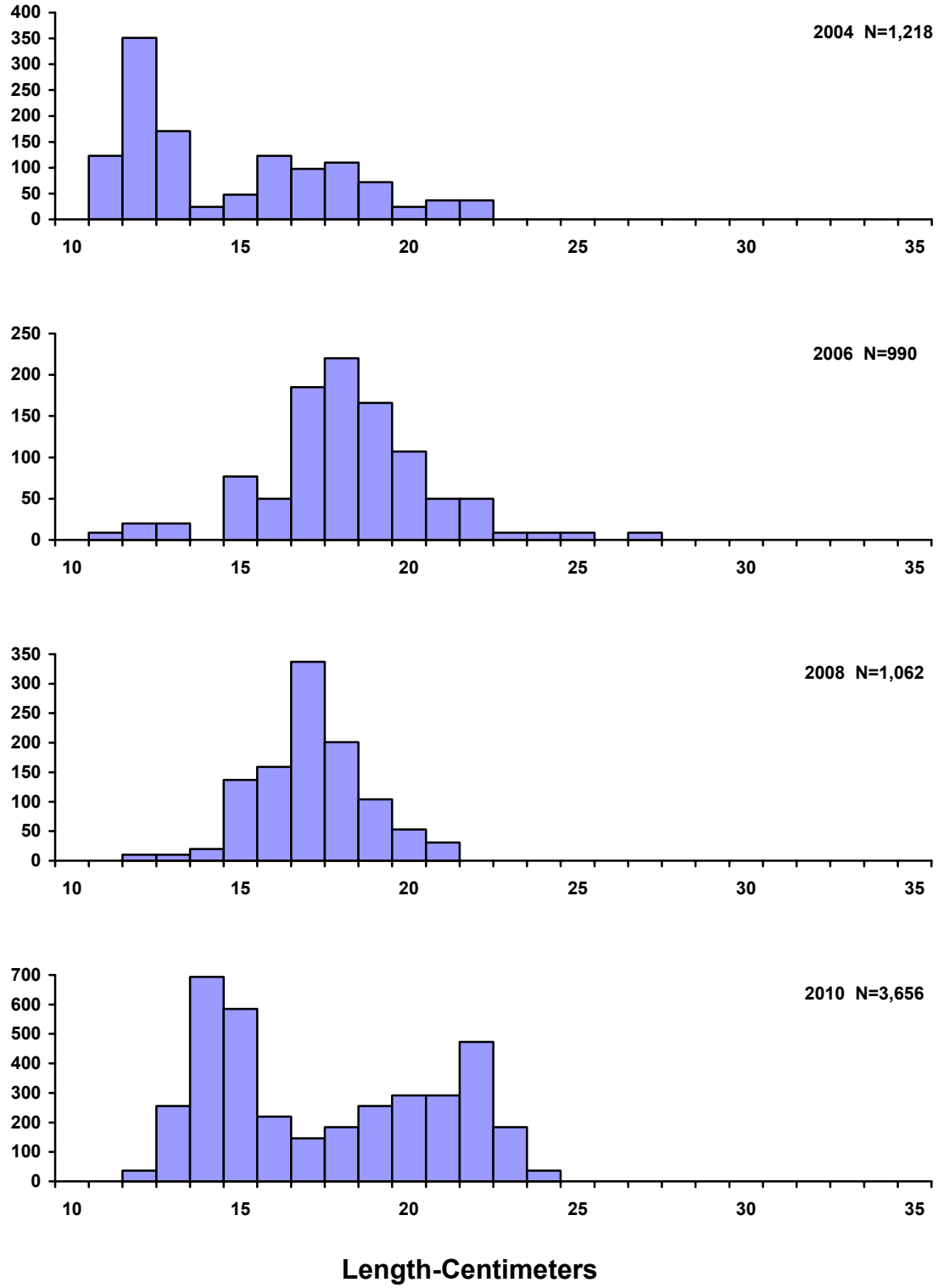

Figure 2. Length frequency histograms for black bullheads sampled with trap nets in Loss Lake, Minnehaha County, 2004, 2006, 2008 and 2010.

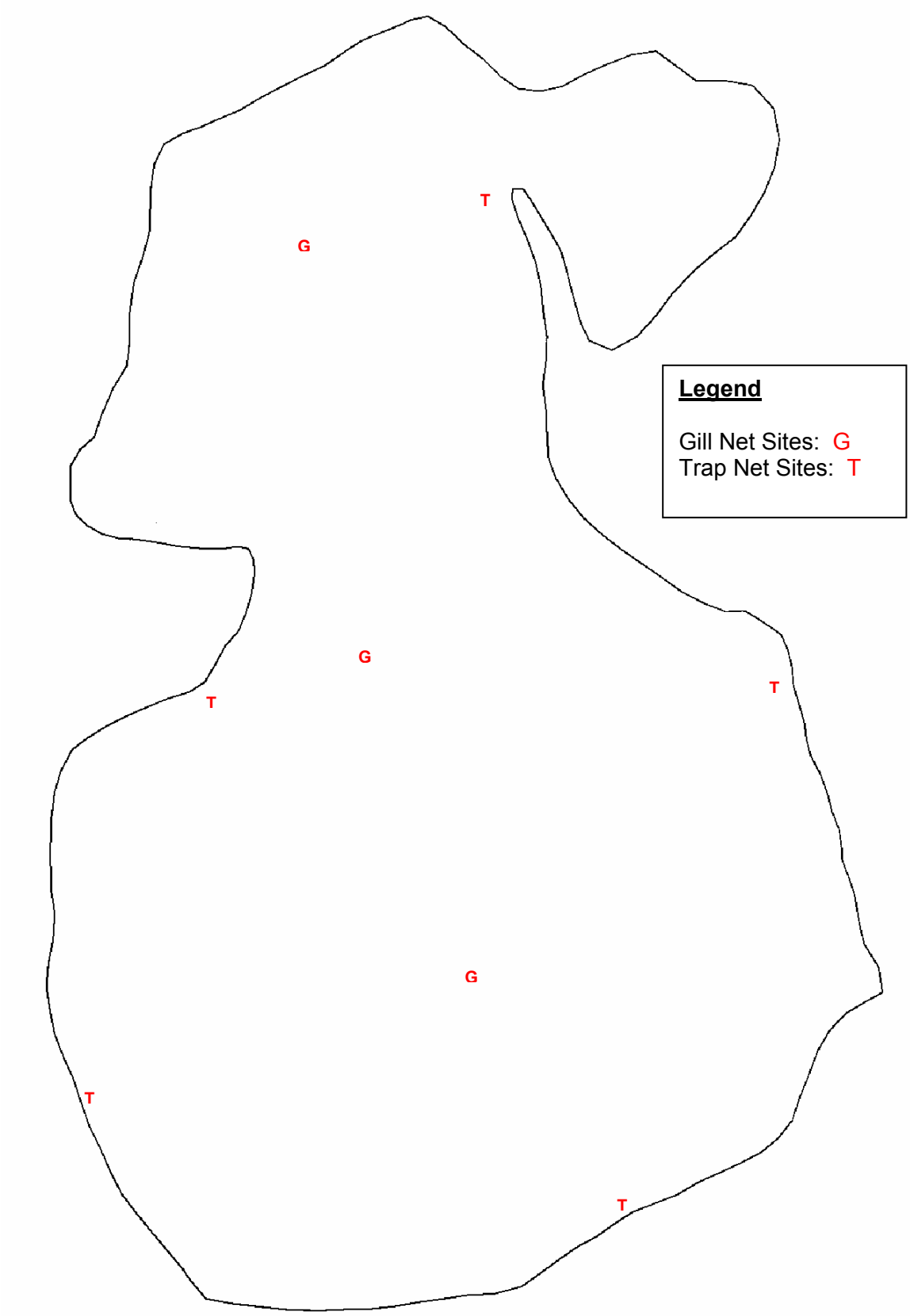

Figure 4. Sampling locations on Loss Lake, Minnehaha County, 2010.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters. (inches in parenthesis).

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25 (10)	38 (15)	51 (20)	63 (25)	76 (30)
Yellow perch	13 (5)	20 (8)	25 (10)	30 (12)	38 (15)
Black crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
White crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
Bluegill	8 (3)	15 (6)	20 (8)	25 (10)	30 (12)
Largemouth bass	20 (8)	30 (12)	38 (15)	51 (20)	63 (25)
Smallmouth bass	18 (7)	28 (11)	35(14)	43 (17)	51 (20)
Northern pike	35 (14)	53 (21)	71 (28)	86 (34)	112 (44)
Channel catfish	28 (11)	41 (16)	61 (24)	71 (28)	91 (36)
Black bullhead	15 (6)	23 (9)	30 (12)	38 (15)	46 (18)
Common carp	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)
Bigmouth buffalo	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.